REMARKS

Claims 1, 11, 18, and 34 been amended. The amendments are supported in the specification on page 13, lines 3-9, among other places. Claims 1-47 remain pending.

The Examiner rejected claims 1, 3-9, 18, 22-25, 27-30, 34, 37-39, and 41-44 under 35 U.S.C. §102(b) as being anticipated by Forslund (U.S. patent 5,659,630). The Examiner has also rejected claim 10 under 35 U.S.C. §103(a) as being unpatentable over Forslund and in view of Garza et al. (US 6,081,659). Claims 11-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Forslund and Pial et al. (US 5,357,632). Additionally, claims 20 and 35 are rejected under 35 U.S.C. §103(a) as being unpatentable over Forslund and Kober (4,181,936). Claims 21, 26, 36, and 40 are rejected under 35 U.S.C. §103(a) as being unpatentable over Forslund and Schmuter (4,999,785). Claims 31-33 and 45-47 are rejected under 35 U.S.C. §103(a) as being unpatentable over Forslund and McCubbrey (4,484,394). Claim 19 is rejected under 35 U.S.C. §103(a) as being unpatentable over Forslund. The Examiner's rejections are respectfully traversed as follows.

Claim 1 is generally directed towards an "apparatus for analyzing a plurality of image portions of at least a region of a sample." Claim 1 also requires "a plurality of processors arranged to receive and analyze the image portions" where "the processors [are] arranged to operate in parallel and [are] configurable to implement one or more algorithms from a plurality of different algorithms for analyzing the image portions selected to determine whether the corresponding regions of the sample are defective." Claim 1 also requires "a data distribution system arranged to receive image data, select at least a first processor for receiving a first image portion and not a second image portion of the image data and one or more first algorithms selected from the plurality of different algorithms, select at least a second processor for receiving the second image portion and not the first image portion of the image data and one or more second algorithms selected from the plurality of different algorithms, output the first image portion to the first processor and the second image portion to the second selected processor, and configure the first processor with the one or more first algorithms and the second processor with the one or more selected algorithms" Claim 1 also requires that "the first image portion and the second image portion are different rectangular shaped image portions that each has a width that comprises a plurality of pixels and a length that comprises a plurality of pixels."

Independent claim 11 is directed towards an "apparatus for inspecting a plurality of image portions of at least a region of a sample." Claim 11 requires "a plurality of distributors arranged to receive the image portions" and "a plurality of processors that are arranged into a plurality of subgroups that are each coupled to an associated distributor." Claim 11 also require

that "each processor [is] configurable to implement one or more algorithms selected from a plurality of different algorithms for analyzing the image portions to determine whether the corresponding regions of the sample are defective, each distributor [is] configurable to select one or more algorithms selected from the plurality of different algorithms, output selected image portions to its associated subgroup of processors whereby a different set of one or more image portions is output to each associated processor, and configure its associated processor with its selected one or more algorithms, at least two of the processors [are] arranged to analyze at least two of the image portions in parallel." Claim 11 also requires that "the image portions are different rectangular shaped image portions that each has a width that comprises a plurality of pixels and a length that comprises a plurality of pixels."

Independent claim 18 is directed towards a method and requires "receiving data derived from the inspection in a multiprocessor system" and "the system comprising a master processor and a plurality of slave processors". Claim 18 also recites "dividing the data into groups using the master processor and sending a different data group to each one of the slave processors... wherein each slave processor is configurable to implement one or more algorithms selected from a plurality of different algorithms for analyzing a one of the data groups to determine whether the corresponding portions of the sample are defective." Claim 18 also requires that "the data groups are different rectangular shaped image portions that each has a width that comprises a plurality of pixels and a length that comprises a plurality of pixels."." Claim 24 is also a method claim and requires "outputting each image portion to a selected processor, at least some of the image portions going to different processors" where "each being configurable to implement one or more algorithms selected from a plurality of different algorithms for analyzing the image portions to determine whether the corresponding portions of the sample are defective." Claim 24 also requires "selecting one or more algorithms from the different algorithms of each selected processor and configuring each selected processor with its selected one or more algorithms." Claim 24 also requires "analyzing each image portion for defects within the selected processor based on the selected one or more algorithms for such selected processor." Claim 24 also requires that "the image portions are different rectangular shaped image portions that each has a width that comprises a plurality of pixels and a length that comprises a plurality of pixels."." Claims 34 and 39 are directed towards computer readable medium and have limitations similar to method claims 18 and 24, respectively.

In general, apparatus and/or methods are provided for dividing the image data into image portions or patches which can then be each processed in parallel by different processors which are configurable with different algorithms for determining defects. These image portions (or data groups are different rectangular shaped image portions that have a width that is a plurality of pixels and a length that is a plurality of pixels. In other words, each patch or image portion is

more than one pixel in width (and length). For example, the image portions can look like the following for two processors a and b:

aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaabbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaabbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaabbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaabbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb

In general, Forsland describes a pipelined system with parallelism and a little buffering, which is much different from our image patch processing. Specifically, Forslund discloses "In this invention, speed of inspection is obtained by processing multiple adjacent rasters simultaneously." However, he is referring to a much different configuration from ours. In col. 7 line 11 Forslund states:

> "FIG 7D illustrates the method employed by this invention. The processors are parallel combined in a manner that computes the desired results of vertically contiguous adjacent pixels simultaneously during the full image scan. This technique does not suffer the problem of diminishing returns or parallelism because no new boundary overlap computations are required. Additional parallelism can be attained by abutting additional processors and advancing the image raster stream by the amount of parallelism employed." (Emphasis added).

Forslund's processors assign the processing of pixels in successive scan lines to different processors on rotation. Thus, the pixels given to each processor together look like a comb: a set of lines, each line being as high as the swath but one pixel wide. The regions processed by the different processors are highly intermeshed. That is, Forsland's image portions look like this:

abcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabc
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abcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabcabc
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Where the a pixels are processed by processor a, the b pixels are processor b, and the c pixels are processed by processor c.

Processing rectangular patches, in the manner claimed, has several advantages over the configurations taught by Forsland. Rectangular image processing allows a slower processing rate since the processing rate does not have to keep up with the scanning rate. Since the processing regions are rectangular, defects from a first rectangular portion can be analyzed without waiting for the next rectangular image portion. In contrast, Forsland's processors would have to store a lot more in memory than our patch processors do since the processing regions of Forsland are so highly interleaved. Another advantage of our patch processing system related to this is that we can process algorithms that have a highly variable processing time per patch – *e.g.*, the processors do not have to keep up with the scanner as tightly.

In sum, Forslund fails to teach or suggest apparatus or methods for dividing the image data among different processors which are configurable to use different algorithms to determine defects, where the image portions are rectangles, each having a multiple pixel width and length, in the manner claimed. The secondary references also fails to teach such features.

For the forgoing reasons, it is submitted that claims 1, 11, 18, 24, 34, and 39 are patentable over the cited references.

The Examiner's rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-10, 12-17, 19-23, 25-33, 35-38, and 40-47 each depend directly from independent claims 1, 11, 18, 24, 34, or 39 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 1, 11, 18, 24, 34, and 39. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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